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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,372	08/10/2001	Jun Nakagawa	110106	2666
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EXAMINER				
PAPPAS, PETER				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/889,372

Applicant(s)

NAKAGAWA, JUN

Examiner

PETER-ANTHONY PAPPAS

Art Unit

2628

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 10-12, 20-22 and 27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 10-12, 20-22 and 27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-884)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

1. It is noted that the Examiner attempted to contact the Applicant to discuss the instant application but the Applicant could not be reached. The Examiner invites the Applicant to contact the Examiner to schedule an interview to discuss the instant application.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 21, 22 and 27 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. While the claims recite a series of steps or acts to be performed, a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing (Reference the May 15, 2008 memorandum issued by Deputy Commissioner for Patent Examining Policy, John J. Love, titled "Clarification of 'Processes' under 35 U.S.C. 101"). The instant claims neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 10-12, 20-22 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foley et al. (Computer Graphics: Principles and Practice) in view of Deering (U.S. Patent No. 6, 734, 850 B2) and further in view of Griffin (U.S. Patent No. 5, 990, 904).
6. In regard to claim 1 Foley et al. teaches an image generation system comprising a memory which stores a program and data for image generating and at least one processor which is connected to the memory and performs processing for image generating (p. 17, §1.6.1; p. 17, Fig. 1.5; p. 170, § 4.3.2, ¶ 1; p. 171, Fig. 4.22).

Foley et al. teaches depth cueing ("The depth (distance) of an object can be represented by the intensity of the images: Parts of the objects that are intended to appear farther from the view are displayed at lower intensity ... This affect is known as depth cueing. Depth cueing exploits the fact that distance objects appear dimmer than closer objects, especially if seen through haze. Such effects can be sufficiently convincing that artists refer to the use of changes in intensity (as well as in texture, sharpness, and color) to depict distance as aerial perspective. Thus, depth cueing may be seen as a simplified version of the effects of atmospheric attenuation." – p. 610, § 14.3.4; pp. 727, 728, §16.1.3; pp. 1044-1046, §20.8.2) such that the color of the object being more distance from a viewpoint is made closer to a target color ("...depth cueing is implemented by interpolating ... Color graphics systems usually generalize the

technique to support interpolating between the color of a primitive and a user-specified depth-cue color, which is typically the color of a background." – p. 611, § 14.3.4).

Foley et al. teaches depth cueing only for an object positioned within a depth cueing area the depth cueing area being defined as a partial subset of a viewing volume based on a position of the viewpoint and includes a backward clipping plane of the viewing volume ("For a perspective projection, the view volume is the semi-infinite pyramid ... For parallel projections, the view volume is an infinite parallelepiped ... At times one might want the view volume to be finite, in order to limit the number of output primitives projected on the view plane ... view volume is made finite with a front clipping plane and back clipping plane ... These planes are specified ... relative to the view reference point..." – p. 239, 240, § 6.2; "Back-plane depth clipping can be thought of as a special case of depth cueing..." – p. 611, § 14.3.5). It is noted that said reference point is considered to read on a viewpoint. It is noted that generating a finite view volume from an infinite view volume is considered to read on creating a sub-volume (e.g., view volume) from said infinite view volume for graphic processing. It is noted that the respective claim language discloses a "depth cueing area" and not a "depth cueing volume" and thus it is noted, for example, that a 2D portion (e.g., back clipping plane) of a given view volume, in which depth cueing is performed, reads on a "depth cueing area."

Foley et al. illustrates a depth cueing area in Color Plate II.24 and Color Plate II.25. It is implicitly taught by Foley et al. that said depth cueing area depends, at least to some degree, on a viewpoint as the respective scenes illustrated in Color Plate II.24

and Color Plate II.25 contain various graphic information displayed from a given viewpoint. In addition it is noted that said Color Plates are considered to comprise objects in both the background and the foreground.

As disclosed above Foley et al. teaches that parts of objects that are intended to appear farther from the viewer are displayed at lower intensity (p. 610, § 14.3.4). However, Foley et al. fails to explicitly teach varying an alpha value of the object so that the object being more distant from the viewpoint becomes more transparent. Deering teaches varying an alpha value of the object so that the object being more distant from the viewpoint becomes more transparent ("Another visual effect used to increase the realism of computer images is alpha blending. Alpha blending is a technique that controls the transparency of an object ... Another effect used to improve realism is fogging. Fogging obscures an object as it moves away from the viewer. Simple fogging is a special case of alpha blending in which the degree of alpha changes with distance so that the object appears to vanish into a haze as the object moves away from the viewer. This simple fogging may also be referred to as 'depth cueing' or atmospheric attenuation, i.e., lowering the contrast of an object so that it appears less prominent as it recedes." – col. 2, ll. 34-51; Figs. 6, 7). Deering teaches storing color, alpha and depth (Z) values for each vertex (col. 14, ll. 41-43; Figs. 6, 7).

Foley et al. fails to explicitly teach varying the alpha value for each vertex of the object based on Z-value for each vertex of the object and varying a depth curing value for each vertex of the object based on the Z-value for each vertex of the object. Deering implicitly teaches varying the alpha value for each vertex of the object based on, at least

in part, the Z-value for each of the object because Deering teaches varying the alpha value for each vertex of the object in response to said object moving away from a viewer and depth (Z) is one of the three coordinates (X, Y, Z) utilized by Deering for ascertaining the location of information in space (col. 2, ll. 39-40; col. 14, ll. 41-43; Figs. 6, 7). It is noted that the respective claim language fails to disclose what exactly constitutes a "depth cueing value" and thus it is noted that the combination of color information and alpha, stored for a given vertex, is considered to read on a "depth cueing value" for said vertex. Deering implicitly teaches varying a depth cueing value for each vertex of the object based on, at least in part, the Z-value for each of the vertex as said depth value is a factor in the calculation of a respective alpha value which in turn is a factor, along with color, in the calculation of a respective depth cueing effect. In other words as depth increases for an object which is moving away from a viewer alpha is changed in kind and the combination of said alpha along with respective color information (depth cueing value), as said object moves further and further away, renders the object increasingly more transparent (e.g., color of the object is brought closer to the target color as the Z-value increases).

It would have been obvious to one skilled in the art, at the time of the Applicant's invention, to combine the teachings of Foley et al. and Deering, specifically in regard to the details directed toward depth cueing and atmospheric attenuation, both of which are utilized by Foley et al. and Deering, because through such incorporation it would increase the realism of the computer graphics generated by said system ("Another

visual effect used to increase the realism of computer images is alpha blending...” – col. 2, ll. 34-51).

Foley et al. teaches a viewing means by which rendered objects are viewed dependent on a given perspective projection, wherein the presented view of said objects change in accordance with the change of said perspective projection. The visual effect of said perspective projection is similar to that of photographic (camera) systems (p. 230-236, § 6.1). Foley et al. teaches the use of a synthetic camera (p. 299-302, § 7.3.4).

Foley et al. and Deering fail to explicitly teach sorting objects so that the objects are drawn in succession starting from an object nearest to the viewpoint and drawing an image in an object space in drawing order determined by the sorting process (e.g., front to back). Griffin teaches sorting objects so that the objects are drawn in succession starting from an object nearest to the viewpoint (“...accumulation can be performed in front-to-back ... In a front-to-back approach...” – col. 42, ll. 10-67; col. 43, ll. 1-46), and performing hidden-surface erasing based on a Z-buffer process for the objects (col. 9, ll. 55-57; col. 3, ll. 48-49). Griffin implicitly teaches drawing an image in an object space in drawing order determined by said sorting process because Griffin teaches displaying accumulated graphic information (e.g., via display 142 – col. 12, ll. 46-49) wherein said accumulated graphic information is accumulated in a front-to-back manner. It would have been obvious to one skilled in the art, at the time of the Applicant’s invention, to incorporate the teachings of Griffin into the system taught by Foley et al. and Deering, because such incorporation would reduce the amount of memory required for the

storage of the image data within the graphics system, via the use of accumulation, thus requiring less physical memory to be implemented or allocated within said graphics system for the storage of said image data. Furthermore, Griffin teaches that the system's ability to support advanced real time animation makes it well-suited for games, educational applications, and a host of interactive applications (col. 7, ll. 1-5) and thus such incorporation would improve the flexibility in how said system is implemented.

Foley et al. teaches performing hidden-surface erasing based on a Z-buffer process for the objects while drawing (e.g., scan-converting) graphic information (p. 668-672, § 15.4).

7. In regard to claim 2 Foley et al., Deering and Griffin fail to explicitly teach wherein the most distant image information displayed (e.g., background) includes a color different from said target color (e.g., user-specified depth-cue color). Official Notice is taken that both the concept and advantages of utilizing an image comprised of a plurality of different colors for a background image in a scene (e.g., in a video game) are well known and expected in the art. Thus, it would have been obvious to one skilled in the art, at the time of the Applicant's invention, for said image information utilized by Foley et al., Deering and Griffin to utilize a plurality of colors wherein a selected color may differ from the colors surrounding said selected color because it would allow for the use of more realistic images and improve the overall display quality of the system.

8. In regard to claim 10 the rationale disclosed in the rejection of claim 1 is incorporated herein.

9. In regard to claim 11 Foley et al. teaches a computer readable information storage medium encoded with a computer program (pp. 17, § 1.6.1; p. 18, § 1.6.2; pp. 165, 166, § 4.3; pp. 166, 167, § 4.3.1). The rationale disclosed in the rejection of claim 1 is incorporated herein.
10. In regard to claim 12 the rationale disclosed in the rejection of claim 2 is incorporated herein.
11. In regard to claim 20 the rationale disclosed in the rejection of claim 11 is incorporated herein.
12. In regard to claim 21 the rationale disclosed in the rejection of claim 1 is incorporated herein. It is noted said system is considered to perform the method.
13. In regard to claim 22 the rationale disclosed in the rejection of claim 2 is incorporated herein.
14. In regard to claim 27 the rationale disclosed in the rejection of claim 1 is incorporated herein. It is noted said system is considered to perform the method.

Response to Amendment

15. The prior claim objections have been withdrawn in light of the respective claim amendments and after further consideration.
16. The prior 35 U.S.C. 101 rejections have been withdrawn in light of Applicant's remarks and after further consideration.
17. In response to Applicant's remarks that Foley et al., Deering and Griffin fail to teach or suggest defining a depth cueing area as a partial subset of the viewing volume

the Applicant is directed to the respective above rejections which have been clarified to address said remarks.

18. In response to Applicant's remarks that a Z-value increase is not used to make an object closer to a target color the Applicant is directed to the respective above rejections which have been clarified to address said remarks.

19. In response to Applicant's remarks that the teachings of Griffin do not explicitly state that objects are drawn in succession from nearest to farthest the Applicant is directed to the respective above rejections which have been clarified to address said remarks.

20. Applicant's remarks have been fully considered but they are not persuasive.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PETER-ANTHONY PAPPAS whose telephone number is 571-272-7646. The examiner can normally be reached on M-F 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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